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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,980	06/02/2000	Lizhi Wang	80398.P322	5683

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EXAMINER

HESEL TINE, RYAN J

ART UNIT PAPER NUMBER

2623

DATE MAILED: 07/14/2004

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/585,980

Applicant(s)

WANG, LIZHI

Examiner

Ryan J Hesseltine

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 07 June 2004.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-45 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-45 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some
 - * c) None of:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments on pages 2-4, filed June 7, 2004, with respect to the rejection(s) of claim(s) 1, 12, 23, 34 and 45 under 35 U.S.C. § 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Lee et al. (USPN 6,542,625, previously cited).
2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.
3. Applicant's arguments on page 3, filed June 7, 2004, with respect to claim 12, have been fully considered but they are not persuasive. On page 3, last paragraph, applicant states, "Furthermore, in regards to claim 12, Applicant respectfully submits that the combination of Kinjo and Cosatto do not disclose or suggest, "a color gradient map of the color [graphic] image," "an intensity map of the color [graphic image]," or "a combined map configured to indicate true where said color gradient map is true and said [intensity] map is true," as claimed and described in the present patent application." The examiner admits that Kinjo, Cosatto nor Lee (see below for new grounds of rejection) explicitly discloses the recited "maps," but the examiner respectfully disagrees with applicant's statements. Kinjo discloses the use of a CCD image sensor 32 and an analog-digital (A/D) converter 36 (column 16, line 37-41), which are both well known in the art to produce a two-dimensional "image map." In this case, the examiner is reading step 158, wherein the respective pixels in the regions (image map) are differentiated along a plurality of mutually different directions wherein it is determined whether or not there is a region in which differential values change regularly, as "a color gradient map of

the color graphic image configured to indicate true where a color gradient has a low value” (column 18, line 65-column 19, line 17), and the examiner is reading step 102, wherein the original image (map) is divided into a plurality of regions of black and white pixels by a predetermined threshold, as “an intensity map of the color graphic image configured to indicate true where an intensity value has a high value” (column 17, line 33-42). The examiner is further reading Lee’s AND operation with respect to the detected color region and the image difference as “a combined map configured to indicate true where said color gradient map is true and said intensity map is true” (column 5, line 4-21).

4. Applicant's arguments with respect to claims 3, 5, 14, 16, 25, 27, 36 and 38 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4, 8, 12, 13, 15, 19, 23, 24, 26, 30, 34, 35, 37, 41, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinjo (USPN 5,629,752, previously cited) in view of Lee et al. (USPN 6,542,625, previously cited), hereafter Lee.

7. Regarding claims 1, 23, and 45, Kinjo discloses an apparatus and method of determining at least one candidate patch for human faces in a color graphic image (column 19, line 18-25), comprising: determining a first area of the color graphic image wherein a color gradient (changing differential values) has a low value (exclude the regions in which differential values

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change regularly; column 18, line 65 to column 19, line 17); determining a second area of the color graphic image (white region) wherein an intensity value has a high value (corresponding to a low pixel density value; column 17, line 33-42).

8. Kinjo discloses that if a skin-colored region is present in an image and the hue and saturation of the skin-colored region (suitable hue saturation) are similar to that of the face of a human figure, there is the possibility of such a region being erroneously determined as corresponding to the face of a human figure (column 2, line 6-18), but does not disclose performing a logical AND on said first area and said second areas to determine a third area of the color graphic image, or selecting portions of the third area with suitable hue saturation to form said at least one candidate patch. Lee discloses a method of detecting a specific object such as a human face in an image signal wherein the presence of both a color image difference indicating movement of a face and a color representing a characteristic of the object (such as a skin color) indicates that the face does appear (column 4, line 56-column 5, line 3). This operation is performed by executing an AND operation with respect to the detected color region and the image difference (column 5, line 4-21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform a logical AND on a first area and a second area to determine a third area of a color graphic image as taught by Lee in order to improve the accuracy of face detection by using more than one characteristic to detect a face since the use of single characteristics such as skin color is not robust since it is subject to changes according to ethnic origin, illumination, background, etc. (column 1, line 48-58). Kinjo provides a similar argument in the discussion of only using skin color to detect facial regions since other skin-colored objects would be erroneously determined as face regions (column 2, line 6-18).

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9. Regarding claim 12, Kinjo discloses a system configured to determine at least one location of a human face in a color graphic image (column 19, line 18-25), comprising: a color gradient map of the color graphic image configured to indicate true where a color gradient (changing differential values) has a low value (exclude the regions in which differential values change regularly; column 18, line 65 to column 19, line 17); an intensity map of the color graphic image configured to indicate true (white region) where an intensity value has a high value (corresponding to a low pixel density value; column 17, line 33-42). Lee (see above discussion of claims 1, 23, and 45) discloses a combined map configured to indicate true where said color gradient map (color image difference) is true and said intensity map (detected color region) is true (column 5, line 4-21), and at least one candidate patch is selected from said combined map, wherein said candidate patches have suitable hue (skin color) saturation (column 4, line 60-column 5, line 3; see also Kinjo, column 2, line 6-18).

10. Regarding claim 34, Kinjo discloses an apparatus comprising: a processor (facial-region extracting unit 40) coupled to a memory (ROM) through a bus (inherent); and a detection process (program) executed by the processor from the memory (column 16, line 37-48) to cause the processor to determine a first area of a color graphic image wherein a color gradient (changing differential values) has a low value (exclude the regions in which differential values change regularly; column 18, line 65 to column 19, line 17); determine a second area of the color graphic image (white region) wherein an intensity value has a high value (corresponding to a low pixel density value; column 17, line 33-42). Lee (see above discussion of claims 1, 23, and 45) discloses performing a logical AND on said first area and said second area to determine a third area of the color graphic image (column 5, line 4-21), and selecting portions of said third area

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with suitable hue saturation (skin color) to form at least one candidate patch (column 4, line 60-column 5, line 3; see also Kinjo, column 2, line 6-18).

11. Regarding claims 2, 13, 24, and 35, Kinjo discloses that determining said first area uses a first threshold value comparison (column 39, line 36-44).

12. Regarding claims 4, 15, 26, and 37, Kinjo discloses that determining said second area (density) uses a second threshold value comparison (column 17, line 33-42).

13. Regarding claims 8, 19, 30, and 41, Kinjo discloses fitting an ellipse (elliptical region) to one of said at least one candidate patch (column 21, line 21-28).

14. Claims 3, 5, 14, 16, 25, 27, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinjo in view of Lee as applied to claims 2, 4, 13, 15, 24, 26, 35 and 37 above, and further in view of Lee et al. (USPN 5,583,659, previously cited), hereafter Lee '659.

15. Regarding claims 3, 5, 14, 16, 25, 27, 36, and 38, Kinjo does not explicitly disclose that said first or said second threshold is determined by normalization. On page 8, third paragraph, applicant defines normalization as the average value of the magnitude of the color gradient of all pixels, a fixed percentage of which is then selected as the threshold. Lee '659 discloses a multi-windowing technique for thresholding an image using local image properties wherein the averaged intensity value is used as a threshold level in determining the value of a center pixel (column 10, line 51-column 11, line 21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the first and second thresholds by normalization as taught by Lee in order to provide a variable thresholding method relying on

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localized image characteristics such as local averaged intensity to classify image pixels into either black object pixels or white background pixels (column 2, line 33-48).

16. Claims 6, 7, 9-11, 17, 18, 20-22, 28, 29, 31-33, 39, 40, and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinjo in view of Lee as applied to claims 1, 8, 12, 19, 23, 30, 34, and 41 above, and further in view of Lobo et al. (USPN 5,781,650, cited on applicant's IDS), hereafter Lobo.

17. Regarding claims 6, 17, 28 and 39, Kinjo does not disclose that said third area is eroded or that said combined map includes an eroded boundary. Lobo discloses a system for automatic feature detection and age classification of human faces in digital images wherein a morphological operator first broadens the image's similar intensity regions, then narrows (erodes) the similar intensity regions in a copy of the image, and finally the narrowed image is subtracted from the broadened image (column 4, line 44-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to erode similar intensity regions as taught by Lobo in order to fit an oval (ellipse) to the face template using a potential image of an edge (column 4, line 44-57).

18. Regarding claims 7, 18, 29, and 40, Lobo discloses that said eroding (narrowing) is morphological (column 4, line 49-63).

19. Regarding claims 9, 20, 31, and 42, Kinjo does not explicitly disclose determining if said ellipse is a bad fit to said at least one candidate patch or that said ellipse includes a degree of fit measure. Lobo discloses an oval fitting operation including iteratively updating the oval center position and the oval axes half-lengths until the total energy stabilizes around a minimum value

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and a final fit has been reached (column 5, line 39-48). It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the degree of fit of an ellipse (oval) about a candidate patch as taught by Lobo in order to ensure that the ellipse/oval is properly positioned and scaled to include the optimum amount of information for personnel identification or the like (column 5, line 28-38).

20. Regarding claims 10, 21, 32, and 43, Lobo discloses further processing said at least one candidate patch when said ellipse is a bad fit (iteratively update until total energy stabilizes; column 5, line 39-48).

21. Regarding claims 11, 22, 33, and 44, Kinjo discloses determining if said one of said at least one candidate patch is too smooth (column 18, line 54-63).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069.

The examiner can normally be reached on Monday - Friday, 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan J. Hesseltine
June 29, 2004



JINGGEWU
PRIMARY EXAMINER